which has been made was therefore very desirable, and we feel sure that the addition of a representative of science to the committee will meet with general approval.

As the methods of selecting candidates for the Army have been altered repeatedly during the last twenty years, and as the present regulations, which we owe largely to the exertions of Sir Henry Roscoe, came into action no later than November 1898, it is clear that only an exceedingly small proportion of our present officers have been selected under those regulations and that only a few of these can as yet have reached positions higher than that of a lieutenant. It is certain, therefore, that any defects that may have been detected during the trials of the last two years must, so far as they are due to systems of selection at all, be the outcome, not of the present system, but of those narrower schemes which preceded it, and which, as we pointed out again and again before they were altered, tended to exclude certain classes of candidates from a profession which they were well fitted to adorn. This defect was remedied by the regulations now in force, and we trust that whatever changes may be found necessary there will be no reverting at this critical moment to the narrower policies of the earlier scheme.

There is said to be a strong and, we would venture to add, a highly reasonable feeling on the part of leading military authorities that what the Army wants is a plentiful supply of able candidates. If this be true, as we hope it is, we trust that the committee may find themselves able to make recommendations which will enable clever candidates who may not happen to be endowed with private incomes, or to be cadets of well-to-do families, to enter the Army more freely in the future than has been possible in the past. And, secondly, that they will take care that any new scheme of examination they may propose shall have no tendency to restrict the field of selection, but offer reasonably equal chances, as the present scheme does, to candidates of all suitable types and aptitudes. It would be a national misfortune if any present necessity of the Army should be made the basis of changes which would tend to reproduce the conditions of ten or a dozen years ago.

STUDIES ON THE STRUCTURE OF THE UNIVERSE.[1]

A VERY interesting publication has recently been issued by Mr. Stratonoff, of the Russian Observatory at Tachkent, on the structure of the universe, a problem which has a fascination of its own for most readers quite apart from any real progress which may be made towards its solution.

The question is so vast that the researches of our greatest astronomers have done little more than lead us to the top of Pisgar and show us from afar the promised land, but every newly ascertained fact, or even confirmation of old ones, is a valuable contribution towards the general stock of knowledge which is being gradually accumulated, out of which, perhaps, the genius of some future Newton may evolve some general law.

Before any real advance can be made in the study of the structure of the universe, it is necessary to commence, and perhaps finish, with the Milky Way, that great band of faint stars which has puzzled mankind from the earliest times and which has been explained more according to the imagination of the observers than with any regard to the facts. Indeed, before the age of modern scientific instruments there were no facts to explain anything, and even now, with all our present resources, fresh facts are only being very slowly brought out ; we still depend very largely on eye observations, only the eye we now use is the photographic camera.

We know in a general way that the galaxy is composed of very faint stars, presumably at an immense distance from our system, and that the stars have a tendency to thin out as we leave this region and approach the galactic poles. The great researches of Herschel, W. Struve, Argelander and Seeliger have thrown much light on the distribution of the larger stars as shown in the various catalogues ; there, however, still remained the telescopic stars to deal with, and it is this part of the question that Mr. Stratonoff has taken in hand.

Mr. Stratonoff has devoted himself to the making of a series of charts showing the distribution of the stars in the northern hemisphere and down to 20° south, and for this purpose he has divided the part of the sky dealt with into 1800 separate areas, and tables are given showing the density of the stars in each. These particulars are represented in the maps by a colour scale by which the regions containing the largest number of stars may be seen at a glance.

The first eight maps show the distribution of stars to each half magnitude from the 6th to 9·5 ; and the well-known tendency of the stars below the 6th magnitude to leave the poles and crowd more and more towards the galactic equator is well shown in the case of each magnitude.

The Milky Way itself Mr. Stratonoff considers to be an agglomeration of immense condensations, or stellar clouds, which are scattered round the region of the galactic equator. These clouds, or masses of stars, sometimes leave spaces between them and sometimes they overlap, and in this way he accounts for the great rifts, like the Coal Sack, which allow us to see through this great circle of light.

Mr. Stratonoff also finds evidence of other condensations of stars in these maps ; the nearest is one of which our sun is a member, chiefly composed of stars of the higher magnitudes, which thin out rapidly as the Milky Way is approached.

A second condensation is also found at a distance represented by the stars of magnitudes from 6·5 to 8·5, and a third, still further off, at about the distance occupied by stars of magnitudes from 7·6 to 8.

Mr. Stratonoff has also pushed his inquiries into the distribution of the stars according to their spectral type.

For the purposes of this inquiry the Draper Catalogue has provided the materials. In this catalogue the stars are divided into sixteen classes, known by letters from A to Q. In order, however, to facilitate mapping, Mr. Stratonoff has put all these classes into two :—Class I. embraces the divisions A, B, C and D, and Class II. takes in the rest. These two classes are too large to make these two maps of the distribution of the spectral types of much service, but they may be taken to give some rough idea of the position in the heavens of the stars of Secchi's types I. and II. From a glance at these maps it is seen that the stars of type I., which includes the Sirian and Orion stars, are situated principally near the Milky Way, while those of type II., which includes our sun, are principally condensed in a region coinciding roughly with the terrestrial pole, and only show a slight increase, as compared with other stars, as the galaxy is approached.

This mapping out of stars in their spectral classes is of the highest interest in the study of the structure of the universe, but we doubt whether the study of these types is sufficiently advanced to get any real information which can assist the student in this respect, and we must be content to wait until a far larger number of stars has been accurately observed before such maps can have anything more than a passing value. Mr. Stratonoff, however, has skilfully used the material he had, and we hope that he will take up this part of his subject later on.

[1] "Publications de l'Observatoire Astronomique et Physique de Tachkent. Etudes sur la Structure de l'Univers," par W. Stratonoff, Astrophysician de l'Observatoire de Tachkent.

The atlas also contains five maps showing the distribution of the nebulæ in the northern and southern hemispheres according to the various classes into which they are generally divided. Mr. Stratonoff states that the law which operates to cause the galaxy to be poor in nebulæ is a general one and extends to all classes of these objects, bright, feeble, large and extended. The nebulæ, however, do not appear to have been studied from a spectroscopic point of view, as it is well known that the gaseous nebulæ are chiefly found in the Milky Way.

The last map is devoted to star clusters in both hemispheres, and shows that these objects are intimately connected with the galaxy, the globular clusters, as distinct from star clusters generally, being the only ones which show no tendency to accumulate in this region.

Mr. Stratonoff has executed a laborious piece of research, and we congratulate him on making so interesting a contribution to stellar literature. HOWARD PAYN.

THE GEOLOGICAL SOCIETY AND ITS MUSEUM.[1]

THE Geological Society of London, which was founded in 1807, began in early days to accumulate a collection of rocks and fossils, minerals and recent shells; and when, in 1828, the Society was provided with apartments in Somerset House, adequate space was afforded for the arrangement of the museum. Although many specimens were distributed throughout the rooms, two of these were specially set aside for the museum, an upper room containing the foreign specimens and a lower room mainly for the British rocks and fossils, while the minerals and recent shells were stored in cabinets in the smaller library. The museum then supplied a real educational want, and was of great service in preserving specimens which illustrated many of the papers read before the Society and published in its *Transactions*. Its state may be judged of from the Report of the committee in 1836; they express "the pleasure they derived from the excellent state of preservation of the whole museum, and from the unwearied zeal and discriminating skill displayed by the curator in arranging the collections." For fourteen years William Lonsdale devoted himself to the welfare of the Society, not only reorganising the museum but editing the publications. He retired in 1842 and was succeeded by Edward Forbes. There is no doubt that in those days the museum was fully appreciated, and the lower room particularly, with its cosy fires, was in winter time a pleasant resort for conversation and study.

Meanwhile, however, the work of the Society increased, the library growing especially, while the museum made little progress, and although a curator (who gave his whole time to the museum) was now and again appointed for a period, it was not possible to offer remuneration sufficient for the purpose; and increasing difficulty was felt in keeping the collections properly named and in proper order. In 1868 the Council "decided on the discontinuance of the formation of a general collection," and restricted it "in future to specimens illustrative of papers read before the Society and those received from abroad." In 1874 the Society removed to its present rooms in Burlington House, and took the opportunity to present "superfluous duplicates" to the British Museum, the Museum of Practical Geology and other institutions. Since this date, however, the museum, while occupying valuable space, has been of comparatively little service to science or to any of the fellows. The collection, as a whole, has been sadly neglected, owing to the fact that the other work of the Society has fully occupied the officers. It has been realised, too, that the want which the Society in its earlier days supplied was now better supplied elsewhere, and that the fellows have ceased to take much personal interest in the museum. As Sir John Evans remarked, in his address to the Society in 1875, "the best home for a collection of British specimens was at the headquarters of the Geological Survey" in the Museum of Practical Geology. In 1896 a proposal was made to transfer great part of the Geological Society's collection to the British Museum, but the transfer was not then agreed to. On March 27 of the present year a special general meeting of the Society was again called to consider the matter, and it was then resolved "That in the opinion of this meeting the time has now come when this Society shall transfer its collections to some other museum." That this is a wise resolution most of those who know the museum and value its contents will cordially agree. Nor is this view inconsistent with the possession of a considerable amount of sentiment for the museum and its associations with the early history of the Society, with Greenough, Lonsdale, Fitton, Murchison, Leonard Horner, Daniel Sharpe, Falconer and others who actually worked in the museum or largely contributed to its stores. Those inspired with such sentiment would prefer to see the specimens well taken care of and accessible. It is reckoned that there are 2460 figured or described fossils. In the interests of geological science it is desirable that these be placed in the British Museum, Cromwell Road, where as many type-specimens as possible should be deposited; and it would not be difficult to find appropriate resting-places for all other specimens worthy of preservation.

The question is simply this: How can the specimens in the museum be best dealt with in the interests of geological science? And we hope the Society will soon settle it to the satisfaction of the fellows and of geologists in general.

[1] An article on "The New Museum of the Geological Society" at Burlington House, appeared in NATURE for January 20, 1876, p. 227.

THE ROYAL SOCIETY CONVERSAZIONE.

THE conversazione held at the rooms of the Royal Society on May 8 was a very successful one, and a large gathering assembled to examine the many interesting objects contributed by the fellows and others. We regret that the pressure on our space does not permit the publication of the various explanations carefully given in the official catalogue. But some of the more important of the exhibits have already been referred to in our columns, and we propose to return to more of them later on.

Mr. J. E. S. Moore, the Tanganyika problem. This exhibit was intended to give some idea of the additions which have been made by Mr. Moore, during the second Tanganyika Expedition, to our knowledge of the faunæ in the great African lakes.

Dr. H. E. Annett and Mr. J. E. Dutton, of the School of Tropical Medicine, University College, Liverpool: (1) Specimens of some new blood Filariæ, (2) specimens illustrating the life-history of *Ankylostoma duodenale* of the Chimpanzee. Mr. J. Mackenzie Davidson: (1) Stereoscopic transparencies of electrical discharges, and (2) skiagrams of bullet wounds. Mr. Eric S. Bruce, the meteo-parachute, a new instrument for investigating the upper atmosphere.

Commander D. Wilson-Barker, cloud photographs. Prof. J. W. Judd, F.R.S., on behalf of the Coral Reef Committee of the Royal Society, specimens of Foraminifera and Ostracoda, from Funafuti, Ellice Islands. Mr. H. J. Elwes, F.R.S., reversible drawers of butterflies from the Holarctic Region arranged to show wide distribution and adaptability to extremes of climate. Also to show variation and difficulty of applying binomial system of nomenclature. Mr. Killingworth Hedges, fulgurites, or lightning tubes, from the sand hills at Kensington, N.S.W.

Mr. J. E. Barnard and Dr. Allan Macfadyen exhibited luminous bacteria (from the Bacteriological Laboratory of the Jenner Institute of Preventive Medicine). The luminous bacteria are a group of organisms, whose natural habitat is sea-water. They are the cause of the so-called phosphorescence to be seen at times on such objects as dead fish, meat,